CLAIMS

1. A Coanda flow amplifier (10, 10a, 10b, 10c), comprising

a suction intake (22, 22a, 22b, 22c),

an outlet (24, 24a, 24b, 24c)

a fluid channel (42) extending between the suction intake (22, 22a, 22b, 22c) and the outlet (24, 24a, 24b, 24c), and

a drive-flow inlet (60, 60a, 60b, 60c) that is in fluid-connection with the fluid channel (42) via a drive-flow discharge slit (66),

characterized in that the flow cross section of the drive-flow discharge slit (66) is variably adjustable.

2. The Coanda flow amplifier according to claim 1, characterized in that the drive-flow discharge slit (66) can be completely closed.

3. The Coanda flow amplifier according to claim 1 or 2, characterized in that the Coanda flow amplifier (10, 10a, 10b, 10c) comprises a flow-guiding element (26) that is arranged between the suction intake (22, 22a, 22b, 22c) and the outlet (24, 24a, 24b, 24c) and is axially displaceable along a longitudinal axis (L) of the Coanda flow amplifier (10, 10a, 10b, 10c).

4. The Coanda flow amplifier according to claim 3, characterized in that the suction intake (22, 22a, 22b, 22c) is arranged in a first housing section (14) and the drive-flow discharge slit (66) is formed between a downstream face (50) of the first housing section (14) and an upstream face (54) of the flow-guiding element (26).

5. The Coanda flow amplifier according to claim 3 or 4, characterized in that at least in the area of the drive-flow discharge slit (66), the flow-guiding element (26) is surrounded by a chamber (64) that connects the drive-flow inlet (60, 60a, 60b, 60c) with the drive-flow discharge slit (66).

6. The Coanda flow amplifier according to claim 5, characterized in that the axially displaceable flow-guiding element (26) carries through to the second housing section (16) and is guided in the second housing section (16) in a sealed manner.

7. The Coanda flow amplifier according to one of claims 3 to 6, characterized in that the outlet (24, 24a, 24b, 24c) is arranged in a third housing section (18), whereby a downstream section (36) of the flow-guiding element (26) protrudes into the third housing section (18) and is guided in the third housing section (18) in a sealed manner.

8. The Coanda flow amplifier according to claim 7 characterized in that a sealing element (38) – to seal the flow-guiding element (26) against the third housing section (18) – is arranged in a groove (40) formed on the third housing section (18) and works together with a circumferential surface (32) of the flow-guiding element (26).

9. The Coanda flow amplifier according to one of claims 6 to 8, characterized in that quasi-static sealing elements are provided to seal the flow-guiding element (26) against the second and/or third housing section (16, 18).

10. The Coanda flow amplifier according to one of claims 3 to 9, characterized in that an actuating element (68) is provided to effect the axial displacement of the flow-guiding element (26).

11. The Coanda flow amplifier according to claim 10, characterized in that the actuating element (68) is a piezo actuator.

12. The Coanda flow amplifier according to one of claims 10 or 11, characterized in that the flow-guiding element (26) is resiliently pre-loaded in a direction opposite to the fluid-flow direction (F) in the fluid channel (42) to close the drive-flow discharge slit (66) when the actuating element (68) is in its inactive state.

13. A method for operating a Coanda flow amplifier (10, 10a, 10b, 10c) of any one of claims 1 to 11, comprising the following steps:

feeding a fluid flow that is to be amplified to a suction intake (22, 22a, 22b, 22c),

feeding a drive-flow to a drive-flow inlet (60, 60a, 60b, 60c), whereby the drive-flow inlet (60, 60a, 60b, 60c) is fluid-connected by a drive-flow discharge slit (66) to a fluid channel (42) that extends between the suction intake (22, 22a, 22b, 22c) and an outlet (24, 24a, 24b, 24c),

characterized in that a variable flow cross section of the drive-flow discharge slit (66) is adjusted in such a way so that a pressure ratio between the output pressure of the drive flow when it leaves the drive-flow discharge slit (66) and an intake pressure of the drive flow when it enters the drive-flow discharge slit (66) does not exceed a critical pressure ratio.

14. The method according to claim 13, characterized in that the variable flow cross section of the drive-flow discharge slit (66) is adjusted so that the pressure ratio between the output pressure of the drive flow when it leaves the drive-flow discharge slit (66) and the intake pressure of the drive flow when it enters the drive-flow discharge slit (66) is equal to the critical pressure ratio.

15. A fuel cell system (80; 90) comprising

at least one fuel cell (82; 92),

a fluid source (88; 102, 110, 116),

a fluid line (84; 100, 106, 112),

a Coanda flow amplifier (10; 10a, 10b, 10c) arranged in the fluid line (84; 100, 106, 112), whereby both a suction intake (22; 22a, 22b, 22c) and an outlet (24; 24a, 24b, 24c) of the Coanda flow amplifier (10; 10a, 10b, 10c) are fluid-connected to the fluid line (84; 100, 106, 112), and whereby a drive-flow inlet (60; 60a, 60b, 60c) of the Coanda flow amplifier (10; 10a, 10b, 10c) is fluid-connected to the fluid source (88; 102, 110, 116),

characterized in that the Coanda flow amplifier (10; 10a, 10b, 10c) is a Coanda flow amplifier (10; 10a, 10b, 10c) according to one of claims 1 to 11.

16. The fuel cell system according to claim 15, characterized in that the fluid line (84; 100, 106, 112) is a purge-gas feed line (84) that is connected to the fuel cell (82).

17. The fuel cell system according to claim 15, characterized in that the fluid line (84; 100, 106, 112) is a cathode gas supply line (100) that is connected to the fuel cell (82).

18. The fuel cell system according to claim 15, characterized in that the fluid line (84; 100, 106, 112) is a cold-starting-gas supply line that is connected to a cold-starting component.

19. The fuel cell system according to claim 15, characterized in that the fluid line (84; 100, 106, 112) is an exhaust-gas recirculation line (106, 112) for the recirculation of fuel cell exhaust gas.

20. The fuel cell system according to claim 19, characterized in that the exhaust gas recirculation line (106, 112) is an anode-exhaust-gas recirculation line (112) for the recirculation of anode exhaust gas and that anode gas is supplied to the fuel cell (92) from the fluid source (116).